

SPACE SCIENCE REVIEWS

UNIVERSITY OF HAWAII LIBRARY

LIBRARY USE ONLY



116  
SPACE SCIENCE  
REVIEWS

*Volume 14 (1972-73)*



D. REIDEL PUBLISHING COMPANY

DORDRECHT-HOLLAND / BOSTON-U.S.A.

SPACE SCIENCE

REVIEWS

Volume 14 (1972-73)



All Rights Reserved

Copyright © 1973 by D. Reidel Publishing Company, Dordrecht-Holland

No part of this book may be reproduced in any form, by print, photoprint, microfilm,  
or any other means, without written permission from the publisher

Printed in The Netherlands by D. Reidel, Dordrecht

### *Editorial Committee:*

W. J. G. BEYNON, University College of Wales, Department of Physics,  
Penglais, Aberystwyth, Cards, Wales

Main responsibility: *Theis Neutral Atmosphere and Ionosphere*

C. DE JAGER, Space Research Laboratory of the Astronomical Institute,  
Beneluxlaan 21, Utrecht, The Netherlands

Main responsibility: *Astronomy*

S. I. RASOOL, NASA, Code S.L.,  
400 Maryland Avenue, Washington, D. C. 30546, U.S.A.

W. I. AXFORD, University of California, San Diego, La Jolla, Calif., U.S.A.

C. G. FÄLTHAMMAR, Royal Institute of Technology, Stockholm, Sweden

R. GIACCONI, Smithsonian Astrophysical Observatory, Harvard College Observatory,  
Cambridge, Mass., U.S.A.

K. I. MAEDA, Kyoto University, Kyoto, Japan

Main responsibility: *Magnetosphere and Interplanetary Matter*

JUAN G. ROEDERER, Department of Physics, University of Denver, Denver,  
Colo. 80210, U.S.A.

### *Editorial Board:*

S.-I. AKASOFU, University of Alaska, College, Alaska, U.S.A.

W. I. AXFORD, University of California, San Diego, La Jolla, Calif., U.S.A.

J.-E. BLAMONT, Service d'Aéronomie, Verrières, France

R. L. F. BOYD, University College, London, England

L. BROGLIO, Scuola d'ingegneria aeronautica, Rome, Italy

M. CALVIN, University of California, Berkeley, Calif., U.S.A.

R. R. DANIEL, Tata Institute of Fundamental Research, Bombay, India

C. G. FÄLTHAMMAR, Royal Institute of Technology, Stockholm, Sweden

H. FRIEMAN, Naval Research Laboratory, Washington, D.C., U.S.A.

R. GIACCONI, Smithsonian Astrophysical Observatory, Harvard College Observatory,  
Cambridge, Mass., U.S.A.

W. N. HESS, NASA, Manned Spacecraft Center, Houston, Texas, U.S.A.

A. R. HIBBS, Jet Propulsion Laboratory, California Institute of Technology,  
Pasadena, Calif., U.S.A.

H. C. VANDE HULST, University of Leyden, Leyden, The Netherlands

G. H. LUDWIG, NASA, Goddard Space Flight Center,  
Greenbelt, Md., U.S.A.

R. LÜST, Institut für Extraterrestrische Physik, Garching-München, Germany

G. J. F. MACDONALD, University of California, Santa Barbara, Calif., U.S.A.

K. I. MAEDA, Kyoto University, Kyoto, Japan

H. S. W. MASSEY, University College, London, England

B. M. MCCORMAC, Lockheed Palo Alto Research Laboratory, Palo Alto, Calif., U.S.A.

A. P. MITRA, National Physical Laboratory, New Dehli, India

J. E. NAUGLE, Geophysics and Astronomy Programs Office of Space Sciences,  
Washington, D.C., U.S.A.

H. E. NEWELL, NASA, Washington, D.C., U.S.A.

M. NICOLET, Bureau du Centre National de Recherches de l'Espace, Brussels, Belgium

T. OBAYASHI, University of Tokyo, Tokyo, Japan

B. J. O'BRIEN, Central Government Buildings, Perth, Western Australia

B. PETERS, Technical University of Denmark, Lyngby, Denmark

M. A. POMERANTZ, Franklin Institute, Swarthmore, Pa., U.S.A.

R. W. PORTER, Engineering Services, General Electric Company, New York, U.S.A.

E. RECHTIN, The Pentagon, Washington, D.C., U.S.A.

L. I. SEDOV, Academy of Sciences of the U.S.S.R., Moscow, U.S.S.R.

J. A. VAN ALLEN, The University of Iowa, Iowa City, Iowa, U.S.A.

F. L. WHIPPLE, Smithsonian Astrophysical Observatory,  
Cambridge, Mass., U.S.A.





# TABLE OF CONTENTS

## ARTICLES

AXFORD, W. I. / Interaction of the Interstellar Medium with the Solar Wind	582
CAMERON, A. G. W. / Formation of the Outer Planets	383
CAMERON, A. G. W. / Elemental and Isotopic Abundances of the Volatile Elements in the Outer Planets	392
GULKIS, S., <i>see</i> Newburn, Jr., R.L.	
GULKIS, S. / Thermal Radio Emission from the Major Planets	497
HERMAN, D., J. MOORE, and P. TARVER / Mission Building Blocks for Outer Solar System Exploration	363
HUBBARD, W. B. / The Significance of Atmospheric Measurements for Interior Models of the Major Planets	424
HUBBARD, W. B. and R. SMOLUCHOWSKI / Structure of Jupiter and Saturn	599
HUNTEN, DONALD M. and GUIDO MÜNCH / The Helium Abundance on Jupiter	433
KENNEL, C. F. / Magnetospheres of the Planets	511
KOCKARTS, G. / Helium in the Terrestrial Atmosphere	723
LAL, D. / Hard Rock Cosmic Ray Archaeology	3
LEWIS, JOHN S. / Chemistry of the Outer Solar System	401
LOCKWOOD, JOHN A. / Neutron Measurements in Space	663
MC ELROY, MICHAEL B. / The Ionospheres of the Major Planets	460
MONTGOMERY, MICHAEL D. / The Solar Wind in the Outer Solar System	559
MOORE, J., <i>see</i> Herman, D. <i>et al.</i>	
MOZER, F. S. / Analysis of Techniques for Measuring DC and AC Electric Fields in the Magnetosphere	272
MÜNCH, GUIDO, <i>see</i> Hunten, Donald M.	
MURRAY, BRUCE C. / Imaging of the Outer Planets and Satellites	474
NEWBURN, JR., R. L. and S. GULKIS / A Survey of the Outer Planets Jupiter, Uranus, Neptune, Pluto and Their Satellites	179
PARKER, E. N. / Cosmic Rays in the Outer Solar System	576
PEALE, S. J. / The Gravitational Fields of the Major Planets	412
IRY, JOSEPH W. / A Geopause Satellite System Concept	314
MOLUCHOWSKI, R., <i>see</i> Hubbard, W. B.	
SONNETT, C. P. / Planetary Magnetism in the Outer Solar System	552
REEKANTAN, B. V. / Primaries of Extensive Air Showers of Cosmic Radiation	103
STONE, PETER H. / The Dynamics of the Atmospheres of the Major Planets	444

*STONE, ROBERT G. / Radio Physics of the Outer Solar System	534
*TARVER, P., <i>see</i> Herman, D. <i>et al.</i>	
*The Science Advisory Group / A Strategy for Investigation of the Outer Solar System, Outer Planets, Their Satellites, and Particles and Fields at Great Distances from the Sun	347
VDOVYKIN, GENNADY P. / The Canyon Diablo Meteorite	756
VDOVYKIN, GENNADY P. / The Mighei Meteorite	832

## BOOK REVIEWS

175, 342, 591, 880

\* Articles marked with an asteriks were published in the *Space Science Reviews* special issue on 'Outer Solar System Exploration - An Overview', ed. by J. E. Long and D. G. Rea.